

CONCORDIA UNIVERSITY



ARTS AND SCIENCE **GEOLOGY**



1981-82



Investigations for the presence of the presence of an acid
TGA. Moller et al. evaluated the effect of various
additives, namely, common salts and anhydrides upon
the stability of the polyacrylic acid. Anhydrides, especially
succinic acid, however, are found to have a marked effect on the thermal
stability, especially at the higher temperatures. The
additives, however, do not affect the thermal stability of the polymer.

DEPARTMENT OF GEOLOGY

DEPARTMENT OF GOVERNMENT

COURSE GUIDE

1981-82

This course guide has been prepared months in advance of the 1981-82 academic year and information contained is subject to change.

Students are advised not to purchase any texts before consulting the department of professor concerned.

WHAT IS GEOLOGY?

Geology is the study and understanding of the earth and its relationship to man. Knowledge of minerals and rocks..., the processes that shape the earth's surface..., rifting of continents..., the prediction of landslides and earthquakes..., soil formation and erosion..., the use and conservation of water..., the site selection of roads and buildings..., the search for metals and fuels..., the study of the ocean floors and mountain heights..., the list is infinite - all this and more is geology....

There is now a new chapter opening in man's evolution, that of planetary science, and here too, the approach is primarily geological. However, as fascinating as the heavenly bodies may be, earth is still man's habitat. To make good and wise use of its resources, man has to study and understand the earth. Geology is the study of the earth.

GEOLOGY AND RELATED DISCIPLINES

Because the field of geology is so comprehensive, it is related to many disciplines in the natural and physical sciences. Physics, chemistry, biology, mathematics, engineering and geography are some of the fields closely connected to geology. Other fields such as astronomy, oceanography, hydrology, environmental sciences, soils science, material science, metallurgy, conservation, surveying and forestry are also related to geology. Interdisciplinary programmes can be designed to suit the specific aims of particular students. For instance, a specialization programme in geology may be coupled with a minor programme in ecology or a specialization programme in biology may be attached to a minor programme in geology. Major-minor programmes which combine geology with economics, geography, or business administration can be arranged for individuals with interests in these fields.

HOW DOES ONE BECOME A GEOLOGIST?

To become a geologist, the student should follow the pre-Science curriculum at the collegial level. However, geology courses at the university level can also be taken for credit by non-science students interested in the subject.

To be a professional, the future geologist will follow a 3-year programme consisting of selected geology courses and electives. During the summer the student is encouraged to work in the field as geological assistant with either government surveys, exploration, or engineering companies. The Department considers it essential that the student spends one or two summers in field work before graduation. Advice is given as to job opportunities, and interviews are arranged with employers on campus.

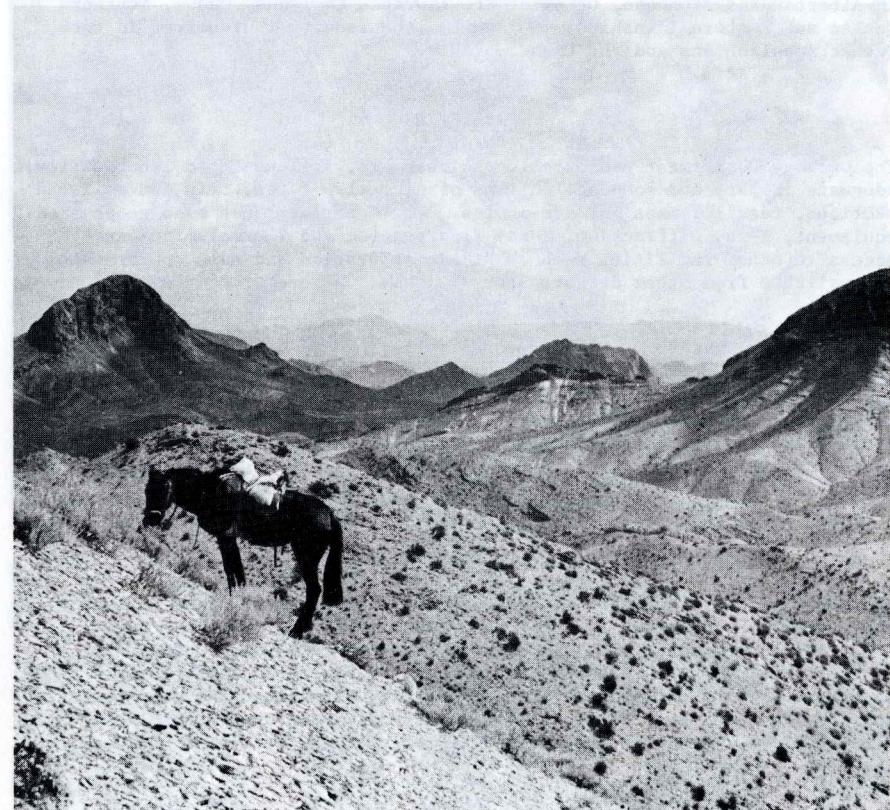
WHAT DOES A GEOLOGIST DO?

The field of geological sciences is so broad and the possibilities of employment so varied that it is impossible to list all the existing openings. A geologist can find employment with the government (including the United Nations, and U.N.-sponsored agencies), or with private companies, as a teacher, or become a consultant and work privately.

Following are some career profiles:

- checking the stability of areas prone to landslides or earthquakes
- surveying on mule-back or helicopter the economic possibilities of a mountainous area in Australia or South-America
- analyzing earth materials for composition, age, strength, physicochemical properties, etc...

- deciding if and where subsurface mining should be extended
- teaching in school or university with possibilities of research grants
- selecting a dam site and evaluating its effectiveness keeping the ecological factor in mind
- as a member of a crew of scientists charting the ocean floor, while studying the rate of deposition, heat flow etc.
- prospecting for mineral deposits in remote areas, using geophysical and geochemical exploration methods, and deciding where to drill
- exploring at a regional scale the still unmapped, rough coasts of Greenland
- investigating for purposes of irrigation the water resources of an arid region
- interpreting by means of aerial photographs the geology of vast, inaccessible regions
- carrying out a seismic survey for oil exploration under the desert sun.



Exploring the Precordillera (Argentina) on horseback.

FACULTY AND THEIR FIELDS OF INTEREST

H.S. de Romer, Ph.D. (McGill), Associate Professor and Chairman
Structural Geology, Photogeology

J.T. Jenkins, M.Sc. (McGill), Associate Professor
Crystal Chemistry, Mineralogy, Igneous and Metamorphic Petrology

P.S. Kumarapeli, Ph.D. (McGill), Associate Professor
Geophysics, Tectonics

D.J. McDougall, Ph.D. (McGill), Professor
Mineral Physics, Thermoluminescence

K.K. Mukherji, Ph.D. (Univ. of Western Ontario), Associate Professor
Carbonate Petrology, Sedimentation

G.P. Sassano, Ph.D. (Univ. of Alberta), Associate Professor
Economic Geology

The faculty had done geological work in Canada, the Alps, the Near East, Ceylon and in South America. In Canada, research projects are carried out in Alberta, Saskatchewan, Ontario, St. Lawrence Lowlands, Gaspe, Northern Quebec and Eastern Townships. Currently, the faculty is involved in the Quebec Appalachians and the Canadian Shield.

FACILITIES

The Geology Department has excellent classrooms, well-equipped laboratories, adequate library and good collections of minerals, rocks, thin and polished sections, fossils, maps and air-photos. The department has also geophysical equipment, X-ray Diffraction, X-ray Fluorescence and Thermoluminescence. Access to other facilities such as Atomic absorption and Mass spectrometer is available from other departments.

STUDENT PARTICIPATION

Students in the Geology programme are strongly advised to participate in the projects of the Geology Club which is run exclusively by them. Activities include initiative in choosing guest lecturers, organizing field trips, preparing exhibits and displays for the annual science week and organizing social events which help expand awareness of the discipline.

SCHOLARSHIPS, FINANCIAL AID, AWARDS, MEDALS, AND PRIZES

Scholarships and prizes are given in recognition of outstanding academic achievements. The medal for geology is awarded annually, when merited, to the graduating student with the highest standing in geology. An annual award is also given by the Canadian Society of Petroleum Geologists to the undergraduate who has demonstrated outstanding competence in fields related to petroleum geology. Financial aid is given to help students solve individual problems. Students are advised to refer to the Office of the Dean of Students.

The small size of the Department ensures an informal and personal relationship between faculty and students.

INFORMATION:

For more detailed information contact:

The Department of Geology

Loyola Campus
7141 Sherbrooke St. West
Montreal, Quebec
Tel: (514) 482-0320, local 328

OR
Sir George Williams Campus
1455 de Maisonneuve Blvd.W,
Montreal, Quebec
Tel: (514) 879-4491



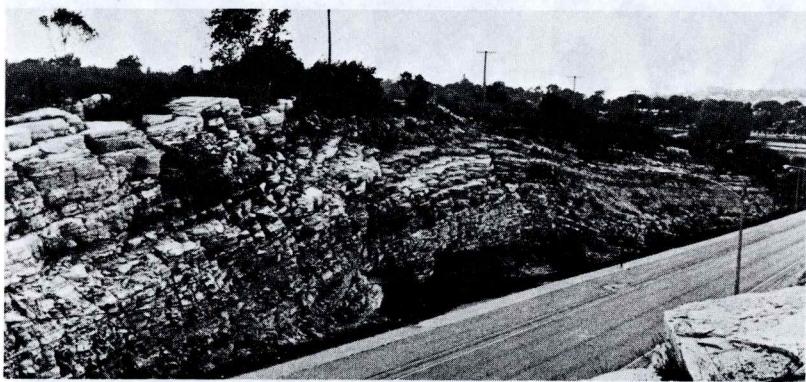
Mud cracks in Potsdam sandstone

BSc. Honours in Geology (75 crs.)

<u>I Year</u>	<u>II Year</u>	<u>III Year</u>
C211 ³ -Mineralogy I	C311 ⁶ -Introd. Petrology	C411 ⁶ -Igneous and Meta-morphic Petrology
C212 ³ -Invertebrate Paleontology	C312 ³ -Mineralogy II	C412 ⁶ -Economic Geology and Ore Deposits
C213 ³ -Structural Geology	C313 ³ -Opt. Crystallography	C413 ⁶ -Sedimentary Petrology
C215 ³ -Photogeology	C314 ³ -Stratigraphy	C414 ⁶ -Research Project
C216 ³ -Exploration Geology	C315 ³ -Tectonics	
C221-Physics of the Earth	C316-Field Geology	

in addition: 6 Science elective chosen from:Chem. C211⁶, C231², C232²
Comp. C211³; Math. C241⁶
Biol. C222³, C223³in addition: 3 elective credits in geologyin addition: 6 elective credits in geologyBSc. Specialization in Geology (63 crs.)

<u>I Year</u>	<u>II Year</u>	<u>III Year</u>
C211 ³ -Mineralogy I	C311 ⁶ -Introd. Petrology	C411 ⁶ -Igneous and Meta-morphic Petrology
C212 ³ -Invertebrate Paleontology	C312 ³ -Mineralogy II	C412 ⁶ -Economic Geology and Ore Deposits
C213 ³ -Structural Geology	C313 ³ -Opt. Crystallography	C413 ⁶ -Sedimentary Petrology
C215 ³ -Photogeology	C314 ³ -Stratigraphy	
C216 ³ -Exploration Geology	C315 ³ -Tectonics	
C221-Physics of the Earth	C316-Field Geology	

in addition: 6 science elective credits chosen from:Chem. C211⁶, C231², C232²
Comp. C211³; Math. C241⁶
Biol. C222³, C223³in addition: 3 elective credits in geology

Limestone road-cut in the St. Lawrence Lowlands

BSc. Major in Geology (Ecology Option) (45 crs.)

<u>I Year</u>	<u>II Year</u>	<u>III Year</u>
C210 ³ -Physical Geology	C212 ³ -Invertebrate Paleontology	C316 ³ -Field Geology
C211 ³ -Mineralogy I	C213 ³ -Structural Geology	
C215 ³ -Photogeology	C311-Introductory Geology	
C220 ³ -Earth History		

in addition: Biol. C230³, C240³ in addition: Biol. C250³

in addition: 6 credits in geology; 3 credits in Ecology

BSc. Major in Geology (39 crs.)

<u>I Year</u>	<u>II Year</u>	<u>III Year</u>
C210 ³ -Physical Geology	C220 ³ -Earth History	
C211 ³ -Mineralogy I	C311-Introductory Petrology	
C212 ³ -Invertebrate Paleontology		
C213-Structural Geology		

in addition: 6 elective credits in geologyBSc. Minor in Geology (24 crs.)

C210³ Physical Geology
 C220³ Earth History
 18 geol. elective credits of which no more than 9 credits can be chosen from the Geol. 200-209 series.



Agglomerate outcrop

GEOLOGY PROGRAMMES

INTRODUCTORY STATEMENT

The programmes are designed to prepare students for both graduate studies and immediate employment. The Department offers five programmes reflecting different levels of concentration in geology: Honours, Specialization, Major (option Ecology), Major and Minor. Out of the 90 credits necessary for the BSc., and normally taken over a 3-year period, the Honours programme specifies 75 credits; 63 credits for the Specialization; 45 credits for the Major, option Ecology; 39 credits for the major in geology and 24 credits are required for the Minor in Geology. For students interested in combining geology with other disciplines, joint programmes are available.

FIELD WORK

Lectures and laboratory work cannot successfully substitute for actual observation and study of geology in the field. Therefore, our department is convinced that field trips to areas of geological interest are an essential part of many courses. In addition, two field schools (Exploration Geology and Field Geology) are conducted by the staff in the two weeks immediately following the spring exams. Although the field schools are required in the Honours and Specialization programmes, other geology students are encouraged to get this field experience, provided they have the necessary prerequisite courses.

SUMMER EMPLOYMENT

Employment opportunities for well trained students are excellent in Canada. It is strongly recommended that prior to graduation at least one summer be spent in some phase of geological work. Although the Department of Geology cannot guarantee summer employment, its students can normally expect to work in geology during the summer months with government agencies or private exploration companies.

NOTE: Geology C201³, C202³, C203³, C204³, C205³, and C220³, may be taken by students in other disciplines who are interested in Geology. No previous background in Geology is required.

Students without CEGEP Geology 901, or equivalent, planning to go into Geology may be required, at the discretion of the Department, to take Geology C210³.

Students who intend to follow joint Major or Minor programmes should consult beforehand with the Chairman of the Department or Faculty Advisers.



Geological field trip in the Bavarian Alps

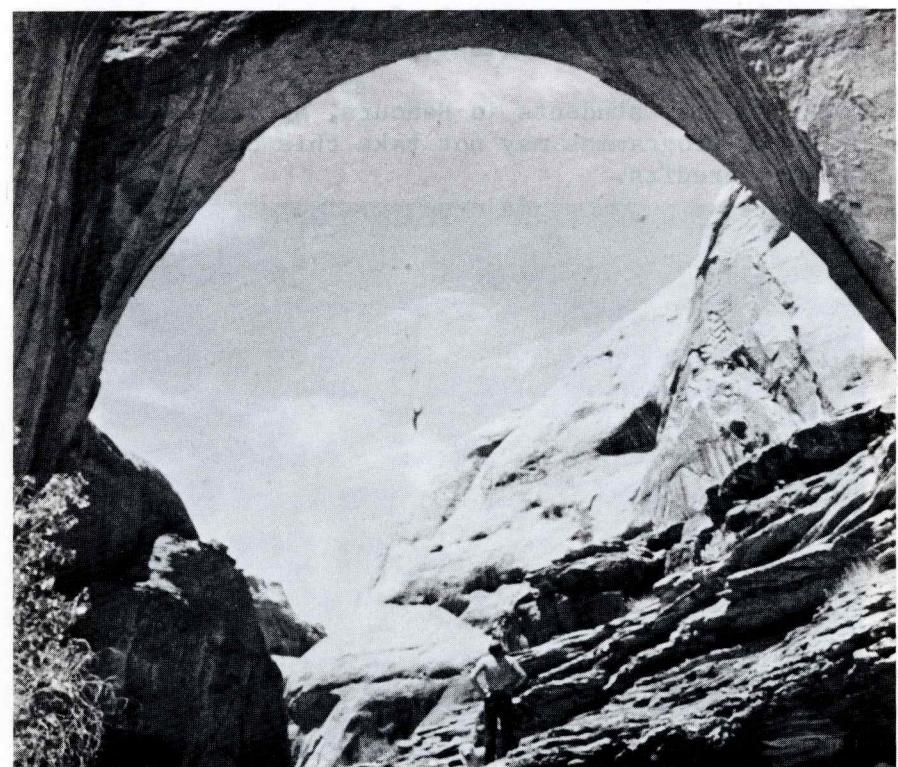
GEOLOGY C201

PRINCIPLES OF GEOLOGY

Professor: D.J. McDougall

The nature, origin and evolution of the universe, stars and of planetary systems: the physical properties of the Earth and its environment; the materials and structures of the Earth's interior and surface, and the processes affecting these regions, such as continental drift, the formation of oceanic basins and mountain building. Lectures only. (3 credits)

NOTE: Science students may not take this course for science credits.



Natural bridge carved by an underground stream

GEOLOGY C202

OCEANOGRAPHY

Professor: K.K. Mukherji

Geomorphology of the ocean floor with emphasis on the significance of the midoceanic ridges and trench systems. The physical and chemical characteristics and circulation of ocean waters and their causes. Tides and waves. Distribution and origin of terrigenous, biogenous, chemogenic, volcanogenic and polygenic sediments in the major ocean basins. Conditions of oceanic sedimentation. Quantitative distribution of suspended sedimentary materials at the ocean bottom. Size composition of suspensions and bottom sediments.

Economic resource potential of the oceans.
Lectures only. (3 credits).

NOTE: Geology students in Honours, Specialization or Major programmes may not take this course for Geology credits.



Backreef lagoon, patch reef, fore reef (San Andres, Bahama Bank)

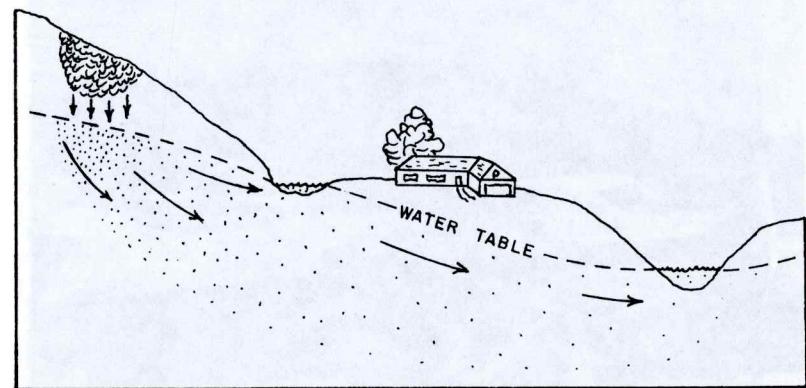
GEOLOGY C203

ENVIRONMENTAL GEOLOGY

Professor: T.B.A.

Geology in the ecosystem. The earth's atmosphere, hydrosphere, lithosphere and biosphere in the geologic time. Long range geological effects of ecosphere pollution. Trace nutrients and health with emphasis on the geology of trace elements and its cause and effect on biological systems. Understanding of, control for, and prevention of natural hazards. Changes in the earth's climate. Role of Geology in land use. Lectures only. (3 credits)

NOTE: Geology students in Honours, Specialization or Major programmes may not take this course for Geology credits.



Transport of contaminants to surface and groundwater from a dump site

GEOLOGY C205

GEOLOGY OF RESOURCES

Professor: T.B.A.

Rocks and ore minerals. Present and future availability of earth resources. The nature, classification and mode of occurrence of mineral deposits. Exploration, development and rational exploitation of mineral resources. Elements of mining economics. Distribution of oil, gas, coal, and base metal deposits. Evaluation of the effects of mining operations on environment. Lectures only. (3 credits)

NOTE: Geology students in Honours, Specialization of Major programmes may not take this course for Geology credits, except by special permission of the Department.



A bush plane can only take so much cargo!

Backreef lagoon, patch reef, fore reef (San Andres, Bahama Bank)

GEOLOGY C210

PHYSICAL GEOLOGY

Professor: D.J. McDougall

An elementary study of minerals and rocks, and of the internal and external processes which shape the earth's surface. Laboratory work deals with identification of minerals, rocks and fossils, as well as interpretation of topographic and geologic maps. Field trips to Mt. Royal, Eastern Townships and Laurentians. Lectures and laboratory. (3 credits).



Look what I found!

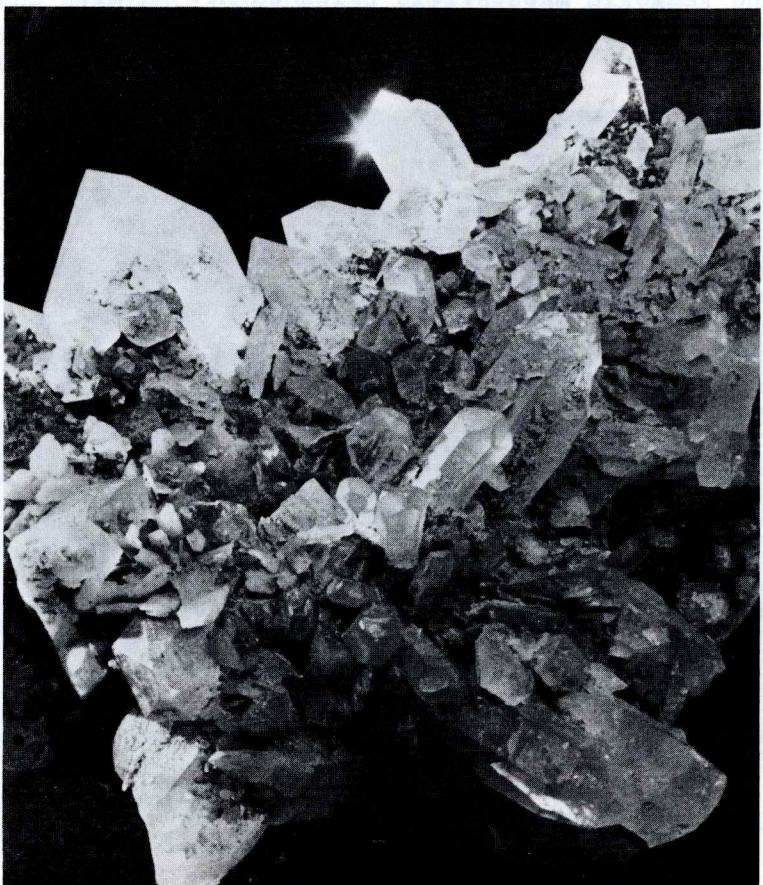
13.

GEOLOGY C211

MINERALOGY I

Professor: J.T. Jenkins

Physical and chemical properties of minerals. Crystallography, crystal notation, stereographic projection. Crystal structures. Identification, description and classification of minerals. One or two field trips near Montreal. Lectures and laboratory. (3 credits).



A cluster of quartz crystals from Quebec

14.

GEOLOGY C212

INVERTEBRATE PALEONTOLOGY

Professor: K.K. Mukherji

Prerequisite: Geol. C210 or equivalent. A systematic survey of major invertebrate fossil groups with chief emphasis on morphology, classification and geologic occurrence. Study of principles of evolutionary concepts and zonation. Some selected discussion on paleoecology. Lectures and laboratory. (3 credits).



Fossils from the Devonian (NW Argentina)

Stereogram of the Mont J. Cartier area (Gaspé)

15.

GEOLOGY C213

STRUCTURAL GEOLOGY

Professor: H.S. de Romer

Prerequisite: Geol. C210 or equivalent previously or concurrently; or permission of the Department. Identification and origin of geologic structures. Primary structures. Evaluation of folds, mesostructures, joints and faults.

Principles of rock deformation. Laboratory includes interpretation of geologic structures by orthographic and stereographic methods. Several field trips, and structural study of selected areas. Lectures and laboratory. (3 credits)



Chevron folds in the Pyrenees

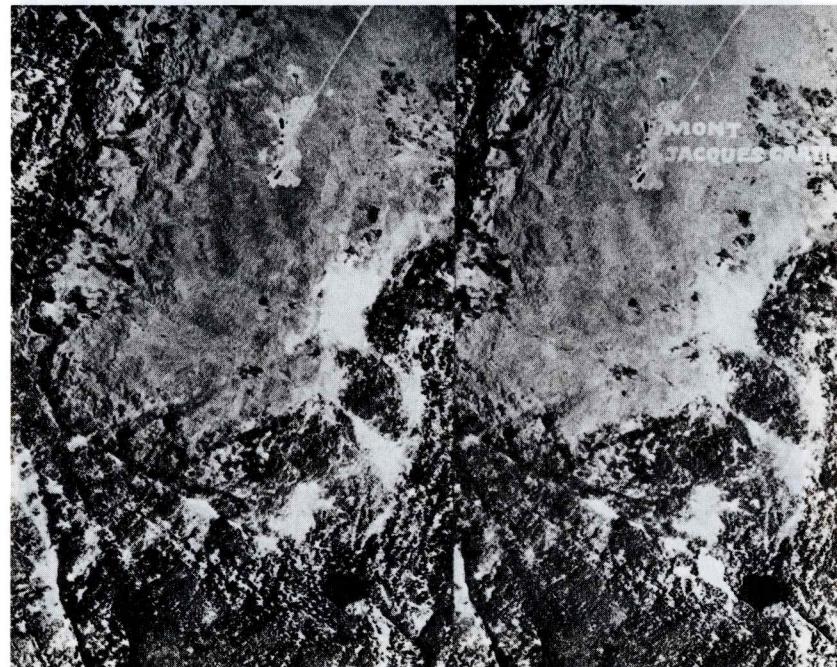
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GEOLOGY C215

PHOTOGEOLOGY

Professor: H.S. de Romer

Prerequisite: Geol. C213 previously or concurrently, or permission of the Department. Evaluation of rocks, landforms and geologic structures by means of aerial photographs. Principles of photointerpretation and photogrammetry. Introduction to remote sensing. Laboratory: Geological interpretation of stereopairs from Canada and other countries; horizontal and vertical measurements and calculations. Construction of base maps using triangulation methods. Preparation of a geological map with sections and report based on photointerpretation. Lectures and laboratory. (3 credits)



Stereogram of the Mont J. Cartier area (Gaspé)

GEOLOGY C216

EXPLORATION GEOLOGY

Professor: Staff Rover man de Romer

Prerequisite: Geol. C221. Two-week field school right after final exams. The first part of the course is taken up by surveying and map preparation. The second part includes actual geophysical surveys, using seismic, magnetic, gravity, electrical and radiometric methods. Students will be required to pay for room and board for a one-week period at the Concordia Field School. (3 credits).



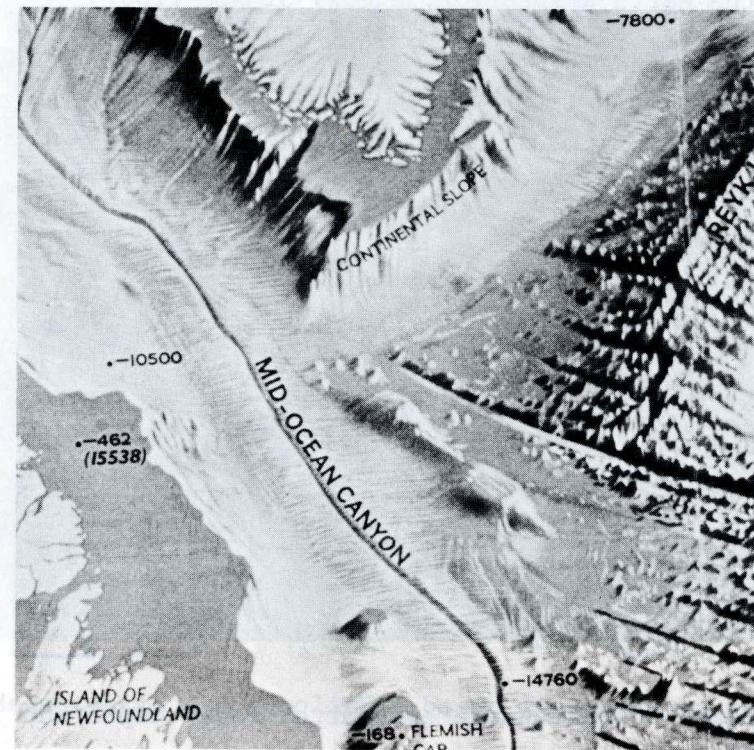
You must stay afloat in exploration!

GEOLOGY C220

EARTH HISTORY

Professor: H.S. de Romer

The hydrologic cycle and the cycles of erosion; the measurement of geologic time; the history of life on earth and the geologic evolution of North America; glaciation and the ice age; the nature and origin of mineral deposits; the geology of coal, oil and gas; the conservation of natural resources. Lectures only. (3 credits)



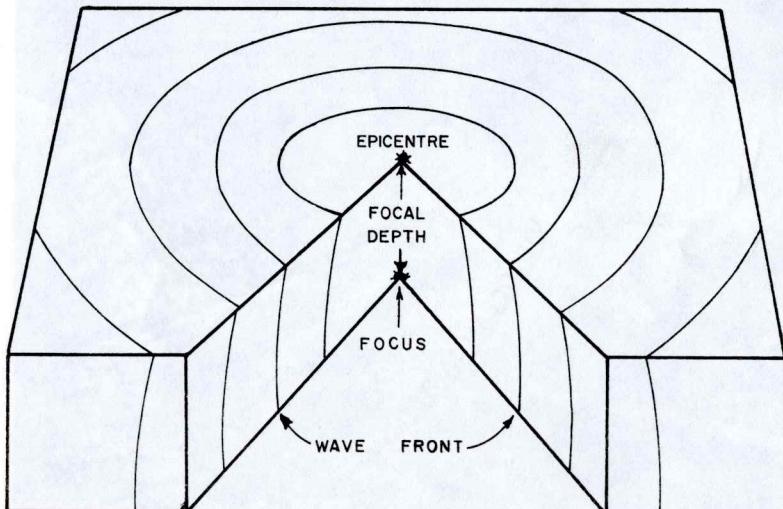
Configuration of oceanic bottom in the NW Atlantic

GEOLOGY C221

PHYSICS OF THE EARTH

Professor: S. Kumarapeli

Prerequisite: CEGEP Math. 103, 203, Geol. C210 or equivalent. This course is directed toward the general understanding of physical phenomena of the solid earth. Subjects for consideration include the following: earth's origin, age, radioactivity, magnetism, gravity field, seismology, heat flow, structure and physical state of the earth's interior, theory of sea-floor spreading, theories of mountain formation. Lectures and laboratory. (3 credits).



Concepts of earthquake epicentre, focal depth and focus

GEOLOGY C311

INTRODUCTORY PETROLOGY

Professors: J.T. Jenkins and K.K. Mukherji

Prerequisite: Geol. C211. The identification and description of hand specimens of igneous, sedimentary and metamorphic rocks. Rock associations. Classification and origin of major rock groups. Lectures and laboratory. (6 credits).



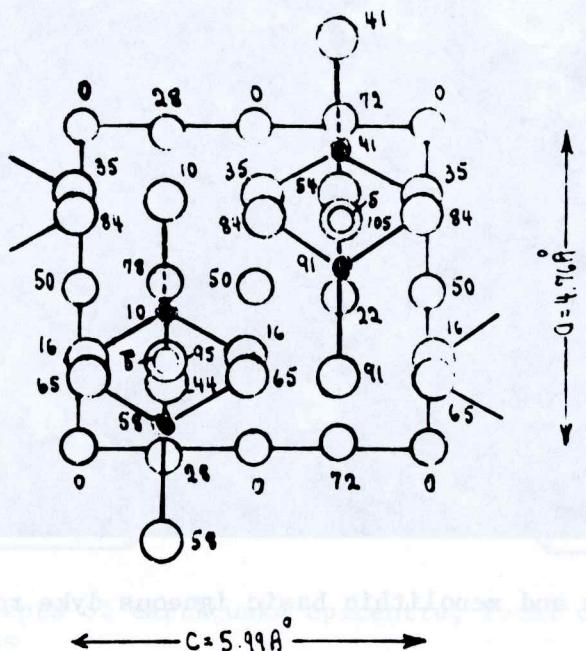
Megacrystic and xenolithic basic igneous dyke rock

GEOLOGY C312

MINERALOGY II

Professor: J.T. Jenkins

Prerequisite: Geol. C211. Point and translational symmetry, point groups, space groups, interpretation of space group tables, elements of crystal chemistry, chemistry and phase relations of important rock forming minerals. Stereographic projections of crystal data; the Universal Stage and powder diffractometry in identifying minerals and subjects stressed in laboratories. Lectures and laboratory. (3 credits).



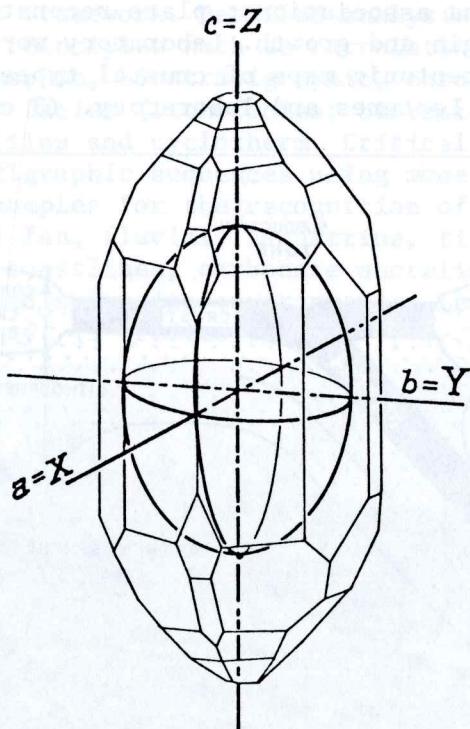
Crystal structure of the olivine, fosterite, projected on the (010) plane. Origin at upper right corner.

GEOLOGY C313

OPTICAL CRYSTALLOGRAPHY

Professor: J.T. Jenkins

Prerequisite: Geol. C211. Behaviour of light in crystals. The optical indicatrix. The polarizing microscope and optical properties of minerals. Identification of non-opaque minerals in oil immersion and thin sections. If time permits, use of the Universal Stage will be introduced. Lectures and laboratory. (3 credits).



Optical orientation of orthorhombic crystal

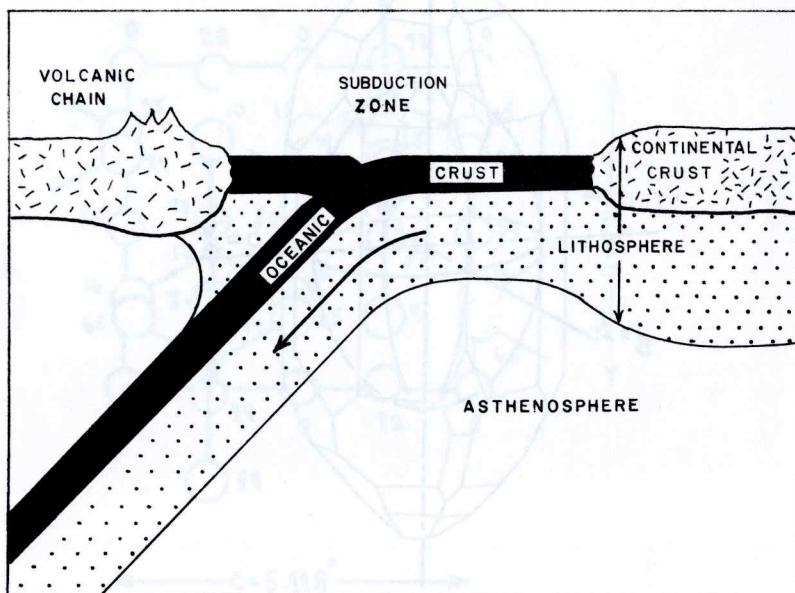
Pennsylvanian cyclolites (West Virginia)

GEOLOGY C315

TECTONICS

Professor: S. Kumarapeli

Prerequisite: Geol. C213, C221. Variations of physical properties in the Earth. Detailed structure of the Upper Mantle. The Crust: crustal types; tectonics of shields, platforms and Phanerozoic fold belts; continental rifts; island arcs; trench belts; oceanic rises. Critical evaluation of the hypothesis of sea floor spreading. Plate tectonics critical evaluation of the hypothesis; magma associations; plate reconstructions. Crustal origin and growth. Laboratory work: studies of tectonic maps of crustal types from continents. Lectures and laboratory. (3 credits).



A lithospheric plate decending into the mantle under the leading edge of another plate.
on the (010) plane. Origin at upper right corner.

GEOLOGY C314

STRATIGRAPHY

Professor: K.K. Mukherji

Prerequisite: Geol. C212 and C311. Introduction to historical developments of stratigraphic concepts. Role of natural dynamic processes in the evolution of stratigraphic record. Discussion on stratigraphic classification and nomenclature. Major classification of tectonic elements in sedimentary basins and broad patterns in the distribution of sedimentary rocks in relation to tectonic framework. Detailed analysis of stratigraphic principles such as correlation (lithostratigraphic, biostratigraphic, chronostratigraphic) facies (lithofacies; biofacies), unconformities and cyclotherm. Critical evaluation of stratigraphic sequences using modern and ancient examples for the recognition of aeolian, alluvial fan, fluvial, lacustrine, tidal flats, barrier coastlines, carbonate shoreline, shallow marine and submarine environments. Lectures and laboratory. (3 credits).



Pennsylvanian cyclothem (west Virginia)

GEOLOGY C316

FIELD GEOLOGY

Professor: Staff

Prerequisite: Geol. C213 and C311 or permission of the Department. Two-week field work right after the final examination period. Working in groups of two, students will map an area, prepare sections and write a geological report. Group studies of important outcrops or outcrop areas and quarries. Students are expected to pay for room and board. Field Work: 2 weeks in May at the Concordia Field School. (3 credits).



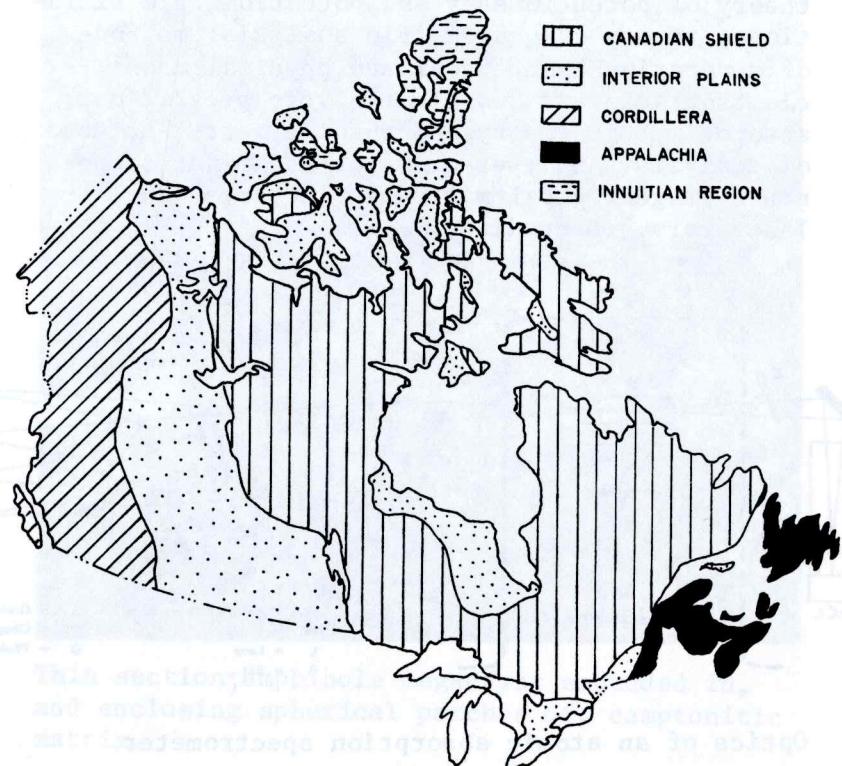
Do you see what I see? new) mattox's natural history

GEOLOGY C322

GEOLOGY OF CANADA

Professor: T.B.A.

Prerequisite: Geol. C201 and C210 (Geol. C314 or C212 also is recommended). Geologic study of the major geomorphic subdivision of Canada with special emphasis on stratigraphy, correlation, paleogeography, sedimentation and tectonics. Reading assignments and colloquium are used to probe into specific problems. Lectures and Seminar. (3 credits).



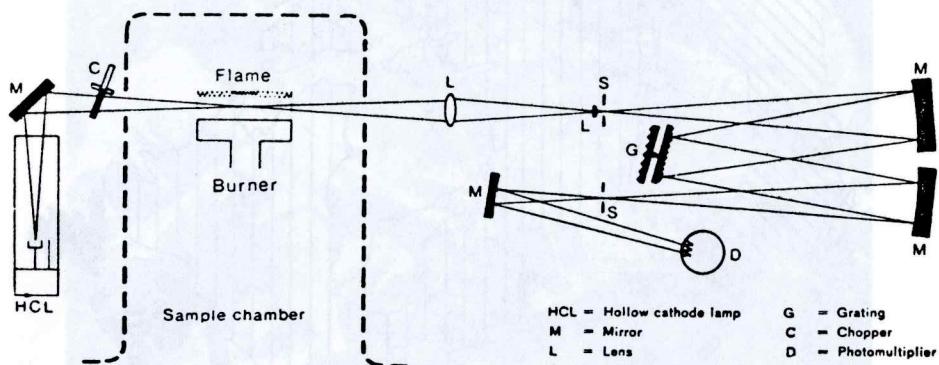
Geological subdivisions of Canada

GEOLOGY C324

ANALYTICAL METHODS IN GEOCHEMISTRY

Professor: T.B.A.

Prerequisite: CEGEP Chem. 201; CEGEP Phys. C301; CEGEP Math. 103 and 203; or equivalent courses. Chemical equilibrium as applied to volumetric and gravimetric procedures; general theory of volumetric titrations, titration curves; application of general titration theory of neutralization precipitation; complexation oxidation-reduction and nonaqueous solvent titrations; theory of potentiometry and potentiometric titrations; theory of gravimetric analysis; methods of separation by chemical and physical means; electrogravimetry and electrolytic separations; absorptiometric theory and absorptiometric methods of analysis. Analyses of major and minor components of geological material. Lectures and laboratory. (6 credits).



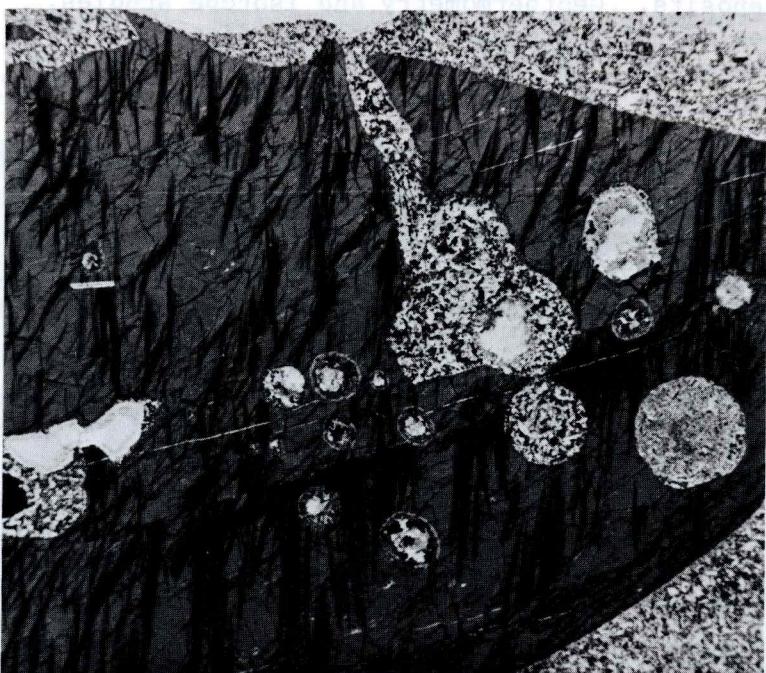
Optics of an atomic absorption spectrometer

GEOLOGY C411

IGNEOUS AND METAMORPHIC PETROLOGY

Professor: J.T. Jenkins

Prerequisite: Geol. C311 and C313. Interpretation of phase diagrams. Mineralogy, fabric and petrogenesis of igneous and metamorphic rocks. Magmatic and metamorphic processes. ACF and AKF diagrams for various metamorphic facies. Study of selected problems. Lectures and laboratory. (6 credits).



Thin section; amphibole megacryst embedded in, and enclosing spherical patches of, camptonitic matrix.

GEOLOGY C412

ECONOMIC GEOLOGY AND ORE DEPOSITS

Professor: T.B.A.

Prerequisite: Geol. C213 and C311. Part I. The Mining industry and the economic problems related to the industrial revolution. Chemical, physical and structural controls of ore forming fluids. The origin and economic evaluation of ore deposits, coal and oil reservoirs. Industrial minerals. Part II. General classification of ore deposits. Geothermometry and isotope studies. Geology of representative mining districts of the world. Laboratory includes property evaluation, ore and petroleum reserve calculations, ore microscopy, examination of ore suites, term projects. Lectures and laboratory. (6 credits)



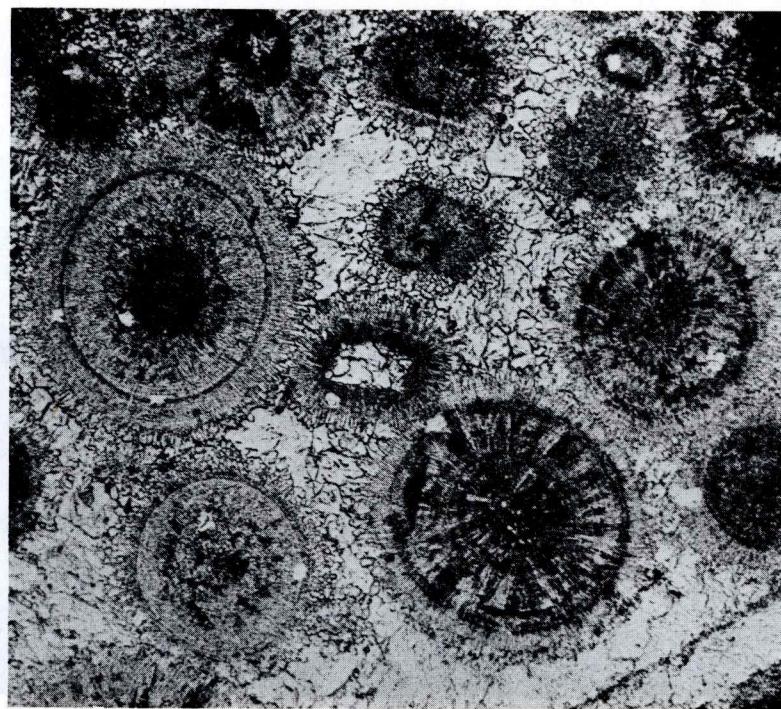
It is nice to have lasagna in the bush!

GEOLOGY C413

SEDIMENTARY PETROLOGY

Professor: K.K. Mukherji

Prerequisite: Geol. C311 and C313. General principles of sediment diagenesis, followed by detail analysis of the diagenetic evolution of sandstone, shale and carbonate rocks. Emphasis is placed heavily on the microscopic criteria in the recognition of diagenetic fabric. Problems of primary sedimentary structures and their hydro dynamic interpretation are also discussed. Specialized topics on current development in sedimentary lithogenesis are also included. Lectures and laboratory. (3 credits).



Mid. Ord. oösparite with early and late diagenetic cement fabric (S. Ont.).

GEOLOGY C414

RESEARCH PROJECT

Professor: Staff

Prerequisite: Permission of the Department. Honours students in their final year are expected to show competence in isolating and examining a geological problem using techniques available within the department, working in conjunction with assigned faculty advisers. Student evaluation will be based on the student's performance in the investigation and on the written report. Specialization students may also take the course at the discretion of the Department. 6 hours per week. (6 credits).



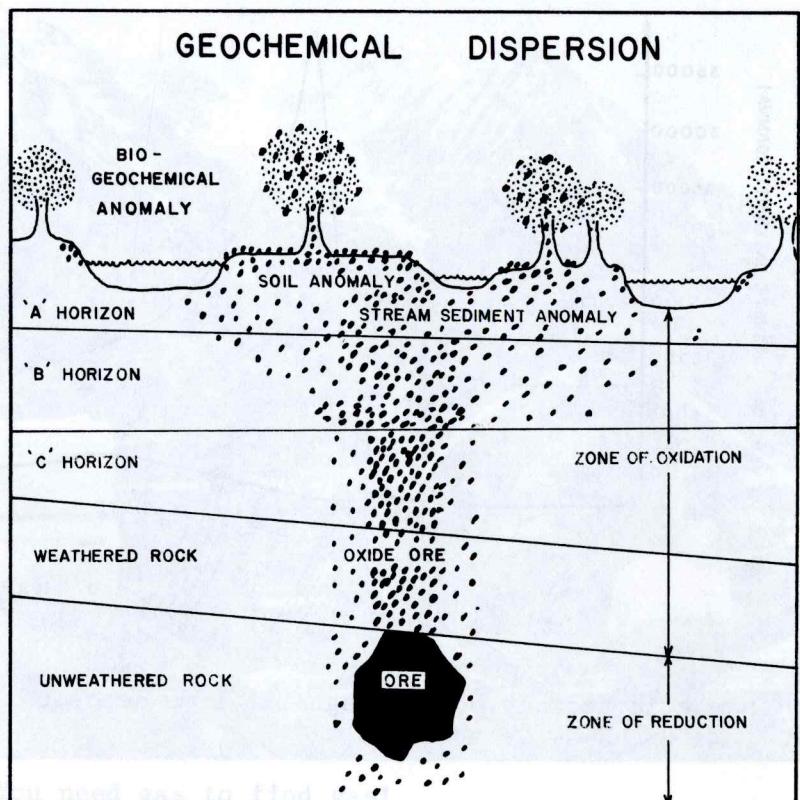
Volcanic and sedimentary strata in a semi-arid environment (Chile).

GEOLOGY C421

EXPLORATION GEOCHEMISTRY

Professor: T.B.A.

Prerequisite: Geol. C210 and C211 or permission of the Department. Basic principles; primary and secondary dispersion processes and their significance in geochemical exploration; field and analytical techniques (one field excursion early in the fall term); interpretation of geochemical data; organization of exploration programmes; selected case histories. Lectures and laboratory. (3 credits)



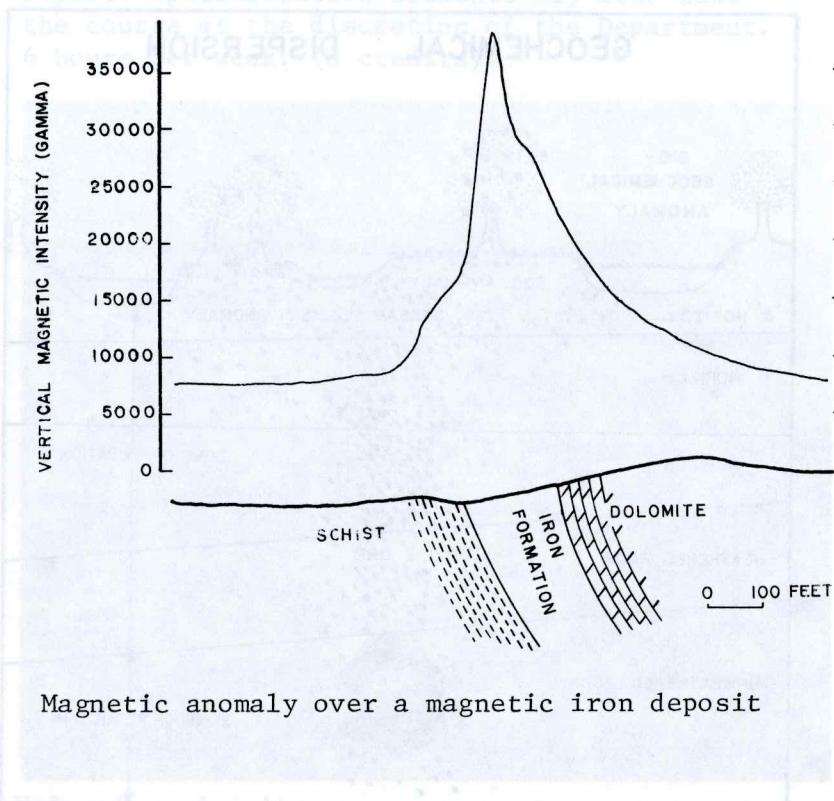
Basic conditions allowing geochemical exploration for ore deposits.

GEOLOGY C422

EXPLORATION GEOPHYSICS

Professor: S. Kumarapeli

Prerequisite: Geol. C210, C211 or permission of the Department. A brief study of the principles of magnetic, gravimetric, electric and seismic methods of mineral exploration; interpretation of geophysical data; organization of exploration programmes; selected case histories. Lectures and laboratory. (3 credits).

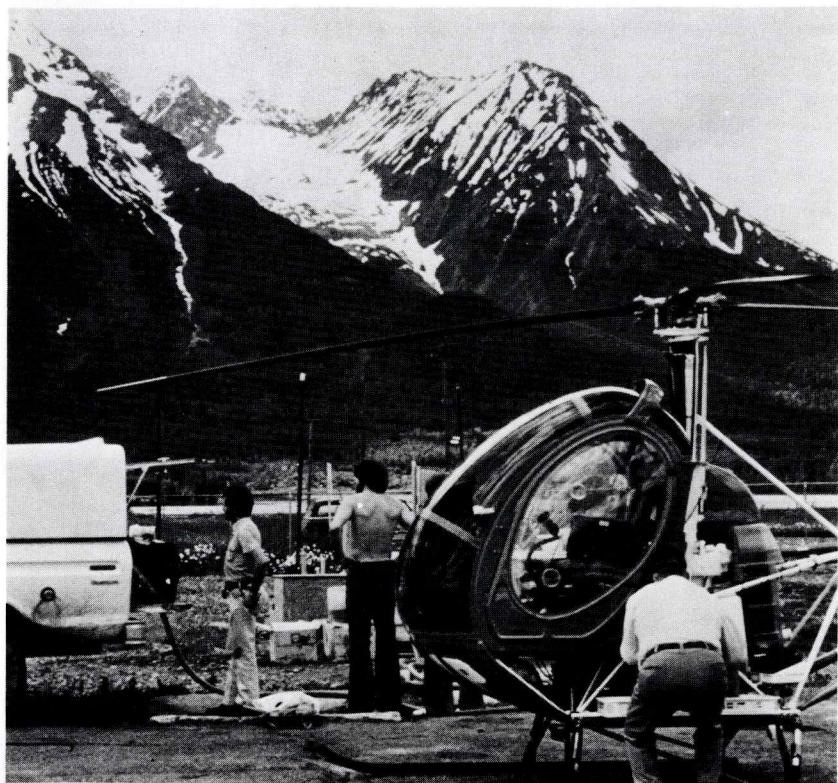


GEOLOGY C425

FOSSIL FUELS

Professor: T.B.A.

Prerequisite: Geol. C314 and C315 or permission of the Department. Origin and accumulation of petroleum hydrocarbons and coal. Distribution of oil, natural gas and coal deposits as a function of geological environments. Geology of major oil and coal fields of the world. Global energy requirements and production forecasts. Lectures only. (3 credits)



You need gas to find gas!